

**REMARKS**

Entry of the foregoing and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111 and in light of the remarks which follow, are respectfully requested.

At the outset, Applicant and Applicants' representative sincerely thank Examiner Patterson of the U.S. Patent and Trademark Office for his time and consideration in participating in a telephonic interview with Applicants' representative on January 26, 2009. During the interview, the outstanding §103(a) rejections were discussed, and in particular, the differences between the applied art and the claimed multilayer structure. The present paper is being submitted for the Examiner's further consideration of the issues.

By the above amendments, new claims 27 and 28 have been added which are directed to additional aspects of a multilayer structure. Support for such new claims can be found in the instant specification at least at page 5, lines 20-29.

In the Official Action, claims 1-3, 5-11, 19 and 21-25 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,164,445 (*Nishida et al*) in view of U.S. Patent No. 5,039,786 (*Pipper et al*). Withdrawal of this rejection is respectfully requested for at least the following reasons.

*Nishida et al* does not disclose or suggest each feature recited in independent claim 1. For example, *Nishida et al* does not disclose or suggest an external layer formed from a composition comprising as a polymer matrix a polyamide composition comprising a polyamide thermoplastic copolymer obtained by copolymerization of  $\epsilon$ -caprolactam, and a mixture of hexamethylenediamine with a diacid comprising at least 9 carbon atoms, the ratio by weight between the  $\epsilon$ -caprolactam and the total

amount of hexamethylenediamine and diacid being between 4 and 9, as recited in claim 1. There is simply no disclosure or suggestion in *Nishida et al* that the ratio by weight between the  $\epsilon$ -caprolactam and the total amount of hexamethylenediamine and diacid is between 4 and 9. Such deficiency of *Nishida et al* has been acknowledged by the Patent Office at page 3 of the Official Action.

Applicants respectfully but strenuously submit that it would not have been obvious to the ordinarily skilled artisan to modify *Nishida et al* by employing the *Pipper et al* copolyamide therein. Concerning such proposed modification, the Patent Office has taken the position that "One of ordinary skill in the art would therefore have recognized the advantage of providing for the copolymer of *Pipper et al* in *Nishida et al*, which comprises an article, depending on the desired formation of the end product." Official Action at page 3. However, no specific indication has been provided by the Patent Office as to why the inclusion of the *Pipper et al* copolyamide would have resulted in a more desirable end product. It is important to note that *Nishida et al* is concerned with providing a polyamide composition having improved tensile strength and tensile break elongation characteristics. For example, at columns 7 and 8 of *Nishida et al*, various examples are discussed which show improvements in tensile strength and tensile break elongation characteristics over comparative examples. *Pipper et al*, on the other hand, provides no indication of improved performance of the very characteristics that *Nishida et al* is concerned with. Accordingly, upon fair and complete consideration of the *Nishida et al* and *Pipper et al* disclosures, it would not have been obvious to the ordinarily skilled artisan to combine such documents in the manner proposed in the Official Action.

Furthermore, Applicants submit that even if *Nishida et al* would have been combined with *Pipper et al* in the manner alleged, the resulting combination would not have resulted in the claimed multilayer structure. Like *Nishida et al*, *Pipper et al* does not disclose or suggest that the ratio by weight between the  $\epsilon$ -caprolactam and the total amount of hexamethylenediamine and diacid is between 4 and 9. In this regard, it is noted that the Patent Office has relied on *Pipper et al* for its disclosure at column 2, lines 29-36, which pertains to the use of caprolactam. The ratio of "0.5 times to twice the amount" disclosed in such paragraph, however, is with respect to the fresh lactam and the extracted lactam. Such ratio is not with respect to the  $\epsilon$ -caprolactam and the total amount of hexamethylenediamine and diacid, as is the claimed ratio. Furthermore, it is noted that the phrase "an aqueous solution of caprolactam which contains, for example, from 60 to 90% by weight of caprolactam" disclosed at col. 2, lines 31-34, does not relate to a ratio of  $\epsilon$ -caprolactam and the total amount of hexamethylenediamine and diacid, as presently claimed.

Respectfully, the excerpt of *Pipper et al* at column 2 relied on by the Patent Office fails to disclose or suggest that the ratio by weight between the  $\epsilon$ -caprolactam and the total amount of hexamethylenediamine and diacid is between 4 and 9.

During the interview, the Examiner noted that *Pipper et al* at column 4, lines 31-35, further discloses that the copolyamides generally have from 70 to 95% by weight of nylon 6 units. Such disclosure, however, pertains to the nylon 6 content of the copolyamide final product. Such excerpt of *Pipper et al* is silent concerning the ratio by weight between the  $\epsilon$ -caprolactam and the total amount of hexamethylenediamine and diacid, and no explanation has been provided as to how such disclosed percentage range inherently results in the use of the claimed ratio

between the  $\epsilon$ -caprolactam and the total amount of hexamethylenediamine and diacid.

Applicants submit that employing a polyamide thermoplastic copolymer obtained by copolymerization of  $\epsilon$ -caprolactam, and a mixture of hexamethylenediamine with a diacid comprising at least 9 carbon atoms, in the formation of an external layer, and employing the ratio by weight between the  $\epsilon$ -caprolactam and the total amount of hexamethylenediamine and diacid of between 4 and 9, can result in a tubular or pipe multilayer structure having improved resistance to stress cracking. Such stress cracking is a significant problem affecting conventional pipes and tubes. The applied art fails to have any recognition or suggestion of such advantages associated with employing the recited polyamide thermoplastic copolymer and ratio range in the formation of an external layer, let alone the specific polyamide thermoplastic copolymer now claimed in claim 1.

For at least the above reasons, it is apparent that the claims are not obvious over *Nishida et al* in view of *Pipper et al*. Accordingly, withdrawal of the above rejection is respectfully requested.

Claims 12 and 14-18 stand rejected under 35 U.S.C. §103(a) as being obvious over *Nishida et al* in view of *Pipper et al*, and further in view of European Patent Document No. 0646627 (*Princiotta et al*). Claim 13 stands rejected under 35 U.S.C. §103(a) as being obvious over *Nishida et al* in view of *Pipper et al*, and further in view of U.S. Patent No. 5,357,030 (*VanBuskirk et al*). Claim 26 stands rejected under 35 U.S.C. §103(a) as being obvious over *Nishida et al* in view of *Pipper et al*, and further in view of U.S. Patent No. 4,881,576 (*Kitami et al*).

Withdrawal of the above rejections is respectfully requested for at least the following reasons.

The deficiencies of *Nishida et al* and *Pipper et al* are discussed above in connection with the obviousness rejection based on the combination of such documents. The secondary applied documents fail to cure such deficiencies of *Nishida et al* and *Pipper et al*. In this regard, the Patent Office has relied on *Princiotta et al* for disclosing the use of an acid-modified ultra low density polyethylene having specific characteristics. Official Action at page 4. *VanBuskirk et al* has been relied on for disclosing the addition of a chain extender to polyamide 6. Official Action at page 5. *Kitami et al* has been relied on for disclosing a gasoline hose having specific characteristics. Official Action at page 6. However, like *Nishida et al* and *Pipper et al*, the secondary applied documents fail to disclose or suggest an external layer formed from a composition comprising as a polymer matrix a polyamide composition comprising a polyamide thermoplastic copolymer obtained by copolymerization of  $\epsilon$ -caprolactam, and a mixture of hexamethylenediamine with a diacid comprising at least 9 carbon atoms, the ratio by weight between the  $\epsilon$ -caprolactam and the total amount of hexamethylenediamine and diacid being between 4 and 9, as recited in claim 1.

For at least the above reasons, it is apparent that independent claim 1 is not obvious over the applied art. Accordingly, withdrawal of the §103(a) rejections is respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance believed to be next in order, and such action is earnestly solicited. If


there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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Date: January 26, 2009

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